



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,264	04/01/2004	Jong Jin Park	021269-013	8445
21839	7590	05/04/2006	EXAMINER	
BUCHANAN INGERSOLL PC (INCLUDING BURNS, DOANE, SWECKER & MATHIS) POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			DICKEY, THOMAS L	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/814,264

Applicant(s)

PARK ET AL.

Examiner

Thomas L. Dickey

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2826

DETAILED ACTION

1. The amendment filed on 03/01/2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by LAWANDY (6,259,506).

Lawandy discloses a method for forming a semiconductor nanocrystal pattern (for example, the bar code of figure 2d) on a substrate 14-16, comprising the steps of a) coating said substrate 14-16 with a dispersion 10a in an organic solvent (a "matrix phase" including solvents and polymers, note column 2 line 13) of, for example, GaN, ZnSe, or CdSe semiconductor nanocrystals in an admixture with a photocurable compound (the said "matrix phase, once the solvent is evaporated, is photocurable, note column 1 lines 56-57); b) evaporating said organic solvent to form a nanoparticle film 10 on said substrate 14-16 of said admixture; c) exposing said film to light (UV light) through a mask (note column 6 lines 32-33); and d) developing the exposed film (col-

Art Unit: 2826

umn 6 lines 34-35). Note figures 1A-B, 2A-D, column 1 lines 37-67, column 2 lines 1-23, column 4 lines 47-66, and column 6 lines 31-44, column 7 lines 54-67, and column 11 lines 1-9 of Lawandy.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 17-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over LAWANDY (6,259,506) in view of KUNZE ET AL. (20050008880).

Lawandy discloses a method with all the limitations of claims 17-19 and 22 except the film of step b) is produced by dispersing the semiconductor nanocrystals and coating the dispersion onto a substrate by spin coating, dip coating, spray coating or blade coating, and dried at 30-100° Celsius before exposure to UV light, that the organic solvent further comprises a photoinitiator selected from a group consisting of acetophenone-, benzoin-, benzophenone- and thioxantone-based photoinitiators, and that the development of step d) is carried out using an organic solvent, a weakly acidic or basic solution, or water. Note figures 1A-B, 2A-D, column 1 lines 37-67, column 2 lines 1-23, column 4 lines 47-66; and column 6 lines 31-44, column 7 lines 54-67, and column 11

Art Unit: 2826

lines 1-9 of Lawandy. Lawandy discloses absolutely no details of the sort specified while disclosing his method, instead leaving it to one of skill in the art to "fill in the blanks" relying either on the known art, or a reasonable amount of experimentation.

However, Kunze et al. discloses a method for forming a semiconductor nanocrystal pattern, including the steps of i) drying a nanoparticle film (note paragraph 0053) at 30-100 degrees Celsius before exposing it to UV light; ii) producing said nanoparticle film by dispersing semiconductor nanocrystals or a photosensitive composition in an organic solvent (appropriate organic solvents including, note paragraph 0047, aprotic solvent and/or an apolar solvent), and coating (note paragraph 0043) the dispersion onto a substrate by spin coating, dip coating, spray coating or blade coating, wherein the organic solvent further comprises a photoinitiator selected from a group consisting of acetophenone-, benzoin-, benzophenone- and thioxantone-based photoinitiators (specifically, 2,2'-azobisisobutyronitrile (AIBN), 1,1'-azobiscyclohexanecarbonitrile, dibenzoylperoxide, butyl lithium, silyl potassium or hexamethyldisilane, and others, note paragraph 0053); and iii) carrying out developing an exposed film (paragraph 0049) using an organic solvent, a weakly acidic or basic solution, or water (note paragraph 0057). Note figures 1A-B, 2A-B, and paragraphs 0039, 0043, 0047-0050, 0053, 0057, 0061, 0064 of Kunze et al. Therefore, it would have been obvious to a person having skill in the art to augment Lawandy's method with the specific steps (using specific materials under specific conditions) taught by Kunze et al. in order to perform Lawandy's method under

Art Unit: 2826

real-life manufacturing line conditions to thus commercialize the method sketched out by Lawandy.

B. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over LAWANDY (6,259,506) in view of ECKBERG ET AL. (5,178,959).

Lawandy discloses a method with all the limitations of claims 20 and 21, including carrying out light exposure using a light source with UV (all UV wavelengths are between 200-500 nm) through a photomask having a predetermined pattern, except carrying out said light exposure at an exposure dose of about 50-850 mJ/cm² and an energy range of 100-800 W. Note figures 1A-B, 2A-D, column 1 lines 37-67, column 2 lines 1-23, column 4 lines 47-66, and column 6 lines 31-44, column 7 lines 54-67, and column 11 lines 1-9 of Lawandy. However, Eckberg et al. discloses that the patterning of photosensitive polymers such as used in Lawandy is optimally carried out using light exposure at an exposure dose of about 50-850 mJ/cm² and an energy range of 100-800 W. Note column 8 lines 32-38 of Eckberg et al. Therefore, it would have been obvious to a person having skill in the art to augment Lawandy's method with the light exposure dose of about 50-850 mJ/cm² an energy range of 100-800 W such as taught by Eckberg et al. in order to optimally expose and develop said light exposure step for the material employed by Lawandy.

Art Unit: 2826

Response to Arguments

4. Applicant's arguments with respect to claims 16-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

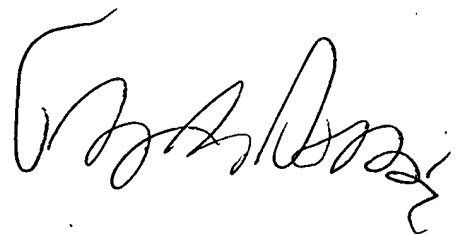
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

Art Unit: 2826

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas L. Dickey
Patent Examiner
Art Unit 2826
04/06